

Gonorrhea

Infections due to *Neisseria gonorrhoeae*, like those resulting from *Chlamydia trachomatis*, are a major cause of pelvic inflammatory disease (PID) in the United States. Occurrence of PID can lead to serious outcomes such as tubal infertility, ectopic pregnancy, and chronic pelvic pain. In addition, epidemiologic and biological studies provide strong evidence that gonococcal infections facilitate the transmission of HIV infection.¹

Following a 72% decline in the reported rate of gonorrhea from 1975 to 1997, in 1999 the gonorrhea rate increased for the second year in a row. Although increased screening (usually associated with simultaneous testing for chlamydial infection), use of more sensitive diagnostic tests, and improved reporting may account for a portion of the recent increase, true increases in disease in some populations and geographic areas also appear to have occurred.²

As with chlamydial infection, reporting of gonorrhea cases to CDC is incomplete. In addition, reporting practices for gonococcal infections have likely been biased towards reporting of infections in persons of minority race or ethnicity who attend public STD clinics.^{2,3} As a result, for most areas, the number of gonorrhea cases reported to CDC reflects many factors, only one of which is the occurrence of the infection among the population. For this reason, new data on gonorrhea prevalence in persons screened in a variety of different settings are useful in assessing disease burden in selected populations.

- In 1999, 360,076 cases of gonorrhea were reported in the United States (Table 1).
- In 1999, the reported rate of gonococcal infections in the United States (133.2 cases per 100,000 persons) increased by 1.2% compared with the rate reported in 1998 (131.6 cases per 100,000 persons) and 9.2% compared with 1997 (122.0 cases per 100,000 persons) (Table 14). Prior to this increase, in the period from 1977 to 1997, the national gonorrhea rate had been declining following the implementation of the national gonorrhea control program in the mid-1970s (Table 1).
- In 1999, 26 states and three outlying areas reported gonorrhea rates below the Healthy People 2000 (HP2000) national objective of 100 cases per 100,000 persons. Eight states and one outlying area had reported rates below the provisional Healthy People 2010 (HP2010) objective of 19 cases per 100,000 persons⁴ (Figure 11 and Table 13).
- The gonorrhea rates in all of the four Census regions of the United States (Northeast, West, Midwest, and South) either increased or stayed approximately constant between 1998 and 1999. All regions, however, had experienced declining rates from 1995 through 1997. As in previous reporting years, the South had the highest rate in 1999 (202.9 cases per 100,000 persons) among the four regions of the country (Figure 12, Table 14).

- The overall gonorrhea rate reported from selected large cities, those with populations over 200,000 persons, was 230.8 cases per 100,000 persons in 1999. This rate is slightly lower than that reported for these cities in 1998 (238.0 cases per 100,000 persons) (Figure 13, Table 18). Fifty-three (83%) of these 64 cities had rates exceeding the HP2000 objective of 100 cases per 100,000 persons. All cities, with the exception of San Juan, Puerto Rico, had reported rates higher than the HP2010 provisional objective of 19 cases per 100,000 persons (Table 17).
- There was no meaningful change in the reported gonorrhea rate among women between 1998 and 1999 (130.0 and 129.9 cases per 100,000 females respectively). The gonorrhea rate in men, however, increased by 2.5% from 132.7 to 136.0 cases per 100,000 males from 1998 to 1999. Reported rates in 1999 among men were greater than the HP2000 objective in 23 states while 1999 rates among women exceeded the objective in 24 states. State-specific reported rates for both men and women were higher than the provisional HP2010 objective of 19 cases per 100,000 persons in 42 states (Figure 14, Tables 15 and 16).
- Changes in the reported 1999 gonorrhea rates, relative to those reported in 1998, differed depending on racial/ethnic group. For example, the rates among Hispanics and Asian/Pacific Islanders were 4% and 6% higher respectively in 1999 than the corresponding group-specific rates in 1998. The 1999 rate among American Indians/Alaska Natives, however, was 7% lower than the rate reported in 1998. Rates among non-Hispanic whites and blacks were similar in 1998 and 1999 (Figure 15 and Table 12B). The 1999 gonorrhea rates for non-Hispanic blacks and American Indians/Alaska Natives were above the HP2000 objective. In 1999, the reported gonorrhea rate among non-Hispanic blacks was about 30 times greater than the rate for non-Hispanic whites.
- Between 1998 and 1999, the reported gonorrhea rates among 15- to 19-year-old adolescents decreased from 547.0 to 534.0 cases per 100,000 persons. For 20- to 24-year-old young adults, the reported rate increased from 605.2 to 614.7 cases per 100,000 persons between 1998 and 1999 (Table 12B).
- Among women in 1999, 15- to 19-year-olds had the highest reported rate of gonorrhea, while among men, 20- to 24-year-olds had the highest rate (Table 12B and Figure 16).
- In 1999, the median state-specific gonorrhea test positivity among 15 to 24-year old women screened in selected family planning clinics in 32 states was 1.0% (range, 0% to 5.2%) (Figure 17).
- Antimicrobial resistance remains an important consideration in the treatment of gonorrhea.^{5,6} Overall, 28.1% of isolates collected in 1999 by the Gonococcal Isolate Surveillance Project (GISP) were resistant to penicillin, tetracycline, or both (Figure 19).
- The proportion of GISP isolates demonstrating decreased susceptibility to ciprofloxacin, one of the currently recommended treatments for gonorrhea, decreased from a high of 1.3% in 1994 to 0.5% in 1996 and 1997, but increased to 0.9% in 1998 and to 1.1% in 1999 (Figure 20). Resistance to ciprofloxacin was first identified in GISP in 1991. From 1991 to 1998, less than 9 ciprofloxacin-resistant isolates were identified each year and such isolates were

identified in only a few GISP clinics. However, in 1999, 19 (0.4%) ciprofloxacin-resistant GISP isolates were identified in 10 of the 26 GISP clinics. Notably, in Honolulu, 14.3% of GISP isolates were ciprofloxacin-resistant prompting CDC and the Hawaii Department of Health to no longer recommend the use of fluoroquinolone antibiotics for treatment of gonorrhea in that state.

- In 1999, all GISP isolates were susceptible to ceftriaxone and to cefixime. The proportion of GISP isolates demonstrating decreased susceptibility to ceftriaxone or cefixime has remained very low over time. To date, no cephalosporin resistance has been identified in GISP.
- The proportion of GISP isolates demonstrating elevated minimum inhibitory concentrations (MICs) to azithromycin has been increasing since GISP began monitoring azithromycin susceptibility in 1992. In 1992, 0.9% of GISP isolates had azithromycin MIC ≥ 0.5 $\mu\text{g/ml}$ compared with 2.9% in 1999. In 1992, there were no isolates with azithromycin MIC ≥ 1.0 $\mu\text{g/ml}$ but in 1999, there were 25 such isolates.
- The percentage of men with gonorrhea who were reported to have had a gonorrhea infection in the previous year, as measured by the GISP, decreased from 21.5% in 1992 to 17.2% in 1999 (Figure 21), approaching the HP2000 objective of 15%.
- GISP also reports the percentage of *Neisseria gonorrhoeae* isolates obtained from men who have sex with men (MSM).^{6,7} The proportion of isolates from MSM increased from 12.0% in 1998 to 13.1% in 1999; in 1988, only 4.0% of GISP isolates were from MSM. Among the nine GISP clinics reporting the majority of MSM cases in 1999, the percentage of cases that were in MSM ranged from 11.3% to 56.8%, with a median of 25.0% (Figure 22).
- Additional information about gonorrhea in racial and ethnic minority populations and adolescents can be found in the **Special Focus Profiles** section.

¹Cohen MS, Hoffman IF, Royce RA, et al. Reduction of concentration of HIV-1 in semen after treatment of urethritis: implications for prevention of sexual transmission of HIV-1. *Lancet* 1997;349:1868-73.

²Centers for Disease Control and Prevention. Gonorrhea – United States, 1998. *MMWR* 1999;49:538-42.

³Fox KK, Whittington W, Levine WC, Moran JS, Zaidi AA, Nakashima AN. Gonorrhea in the United States, 1981-1996: demographic and geographic trends. *Sex Transm Dis* 1998;25(7):386-93.

⁴U.S. Department of Health and Human Services. *Healthy People 2010 (Conference Edition, in Two Volumes)*. U.S. Government Printing Office, Washington, DC, 2000.

⁵Fox KK, Knapp JS, Holmes KK, et al. Antimicrobial resistance in *Neisseria gonorrhoeae* in the United States, 1988-1994: the emergence of decreased susceptibility to the fluoroquinolones. *J Infect Dis* 1997;175:1396-1403.

⁶Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 1999 Supplement: Gonococcal Isolate Surveillance Project (GISP) Annual Report – 1999*. U.S. Department of Health and Human Services. Atlanta: Centers for Disease Control and Prevention, 1999 (in press).

⁷Centers for Disease Control and Prevention. Gonorrhea among men who have sex with men – selected sexually transmitted disease clinics, 1993-1996. *MMWR* 1997;46:889-92.

Figure 10. Gonorrhea — Reported rates: United States, 1970–1999 and the Healthy People year 2000 objective

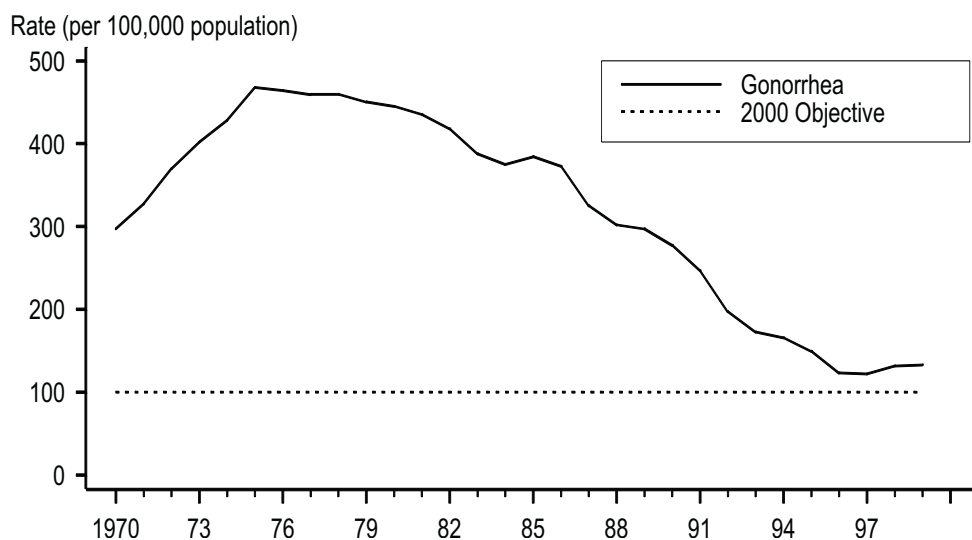
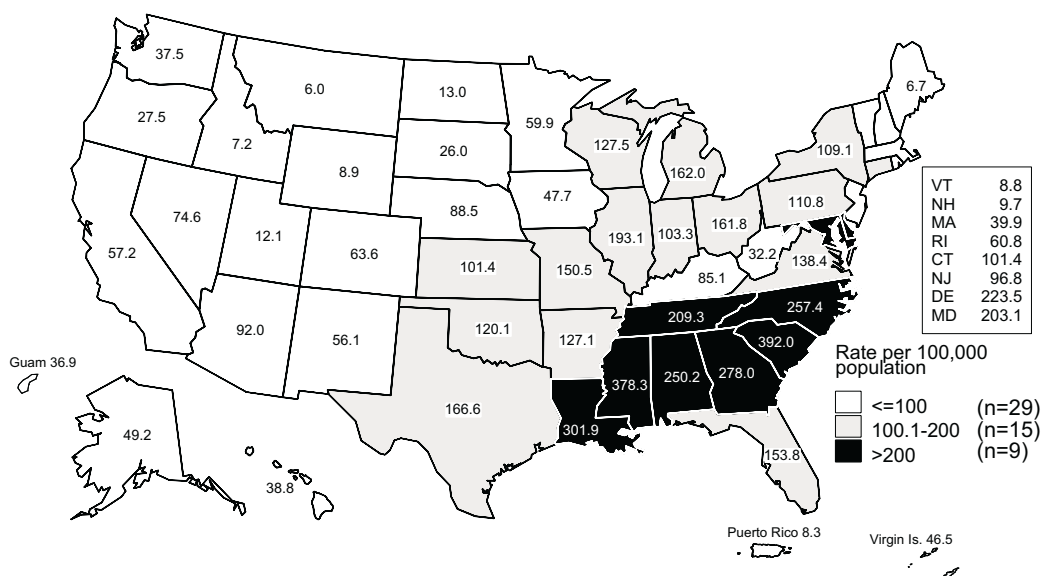


Figure 11. Gonorrhea — Rates by state: United States and outlying areas, 1999



Note: The total rate of gonorrhea for the United States and outlying areas (including Guam, Puerto Rico and Virgin Islands) was 131.4 per 100,000 population. The Healthy People year 2000 objective is 100 per 100,000 population.

Figure 12. Gonorrhea — Rates by region: United States, 1981–1999 and the Healthy People year 2000 objective

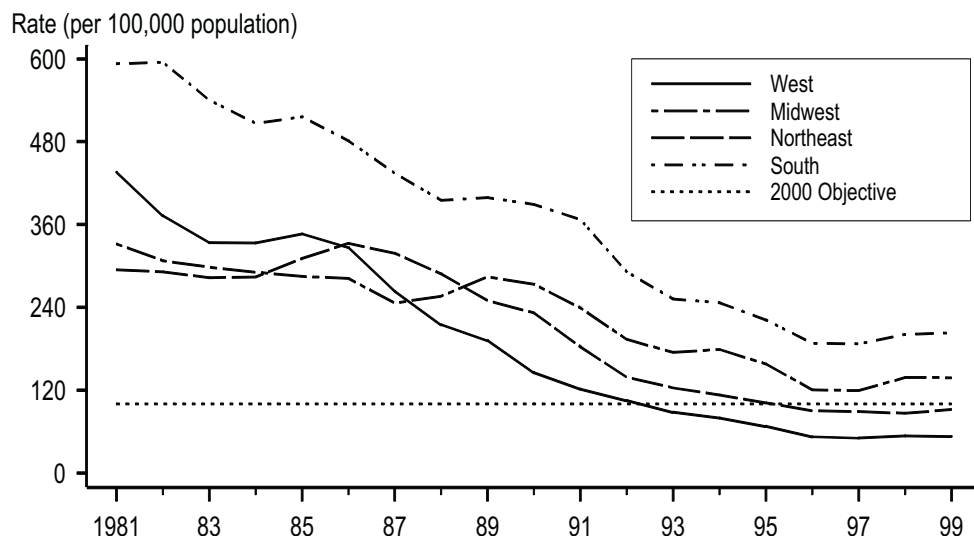


Figure 13. Gonorrhea — Rates in selected U.S. cities of >200,000 population, 1981–1999 and the Healthy People year 2000 objective



Figure 14. Gonorrhea — Rates by gender: United States, 1981–1999 and the Healthy People year 2000 objective

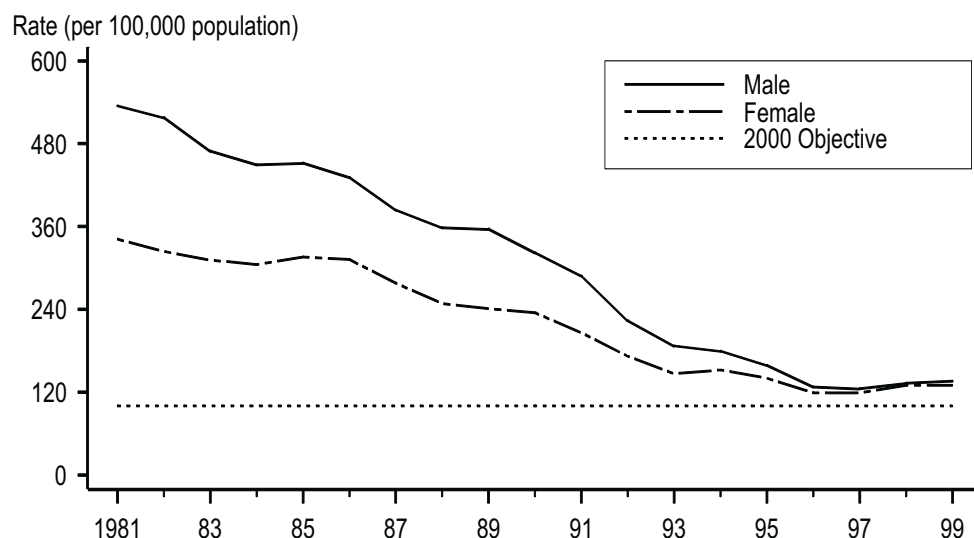
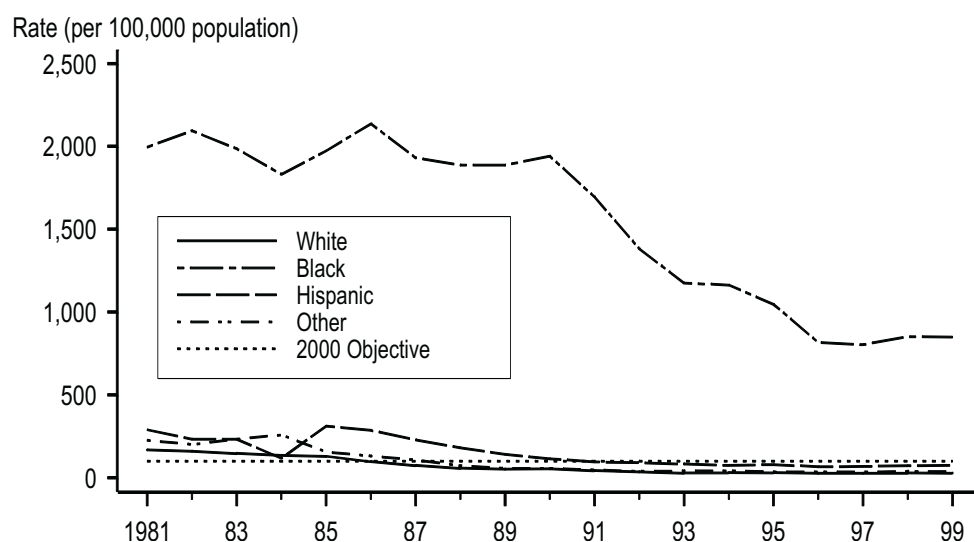


Figure 15. Gonorrhea — Rates by race and ethnicity: United States, 1981–1999 and the Healthy People year 2000 objective



Note: "Other" includes Asian/Pacific Islander and American Indian/Alaska Native populations. Black, White, and Other are non-Hispanic.

Figure 16. Gonorrhea — Age- and gender-specific rates: United States, 1999

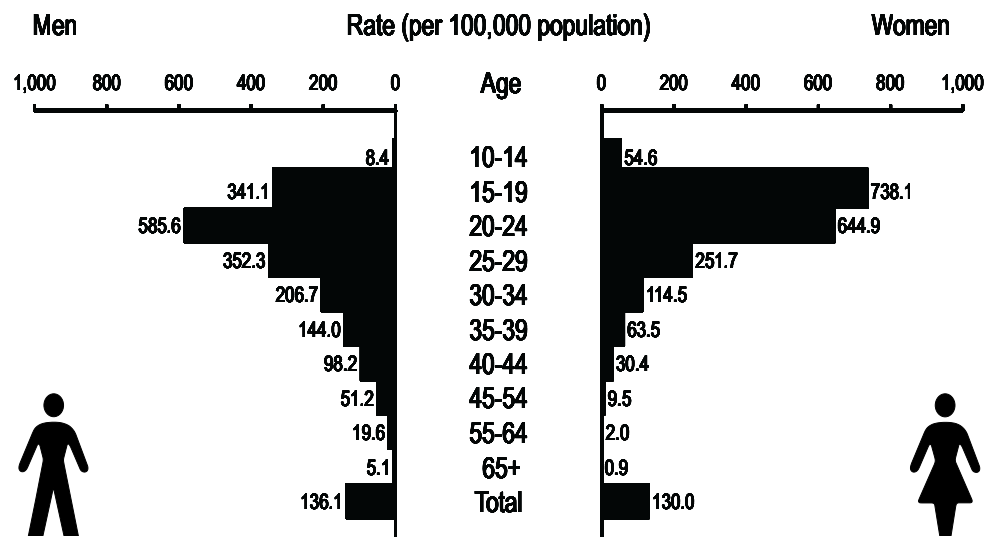


Figure 17. Gonorrhea — Positivity among 15-24 year old women tested in family planning clinics by state, 1999

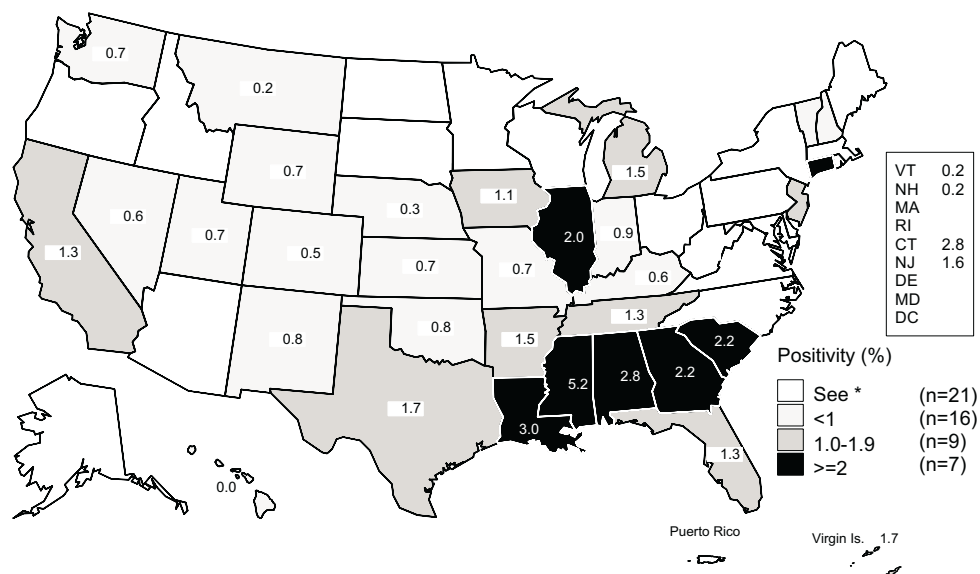


Figure 18. Gonococcal Isolate Surveillance Project (GISP) — Location of participating clinics and regional laboratories: United States, 1999

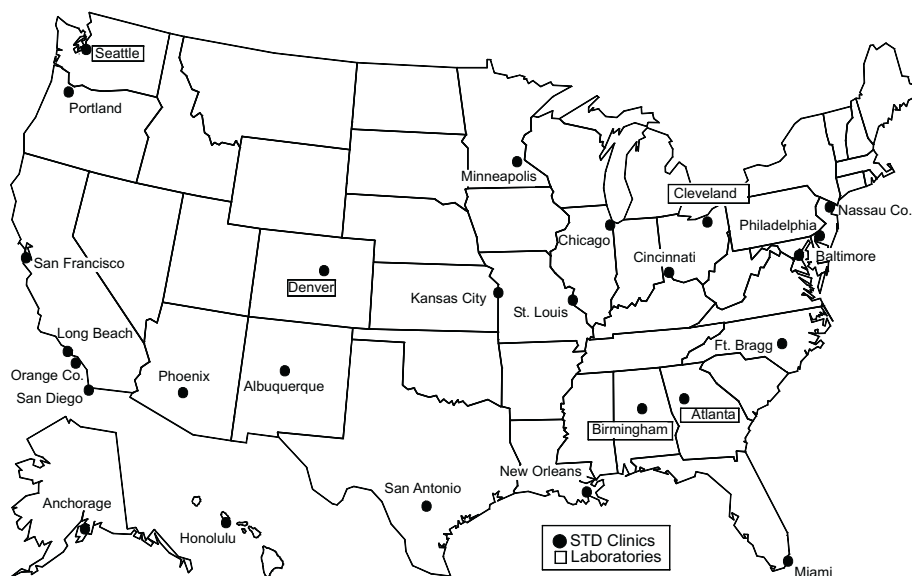
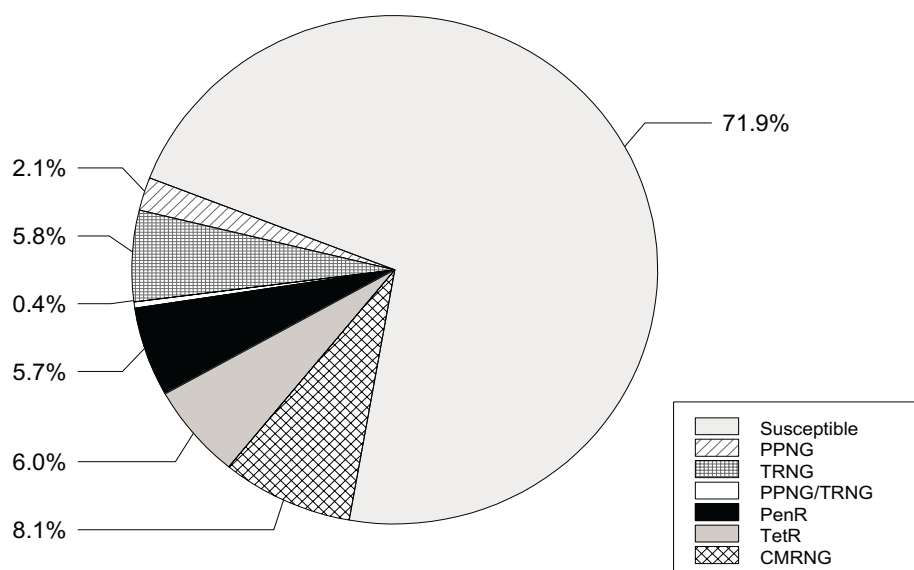
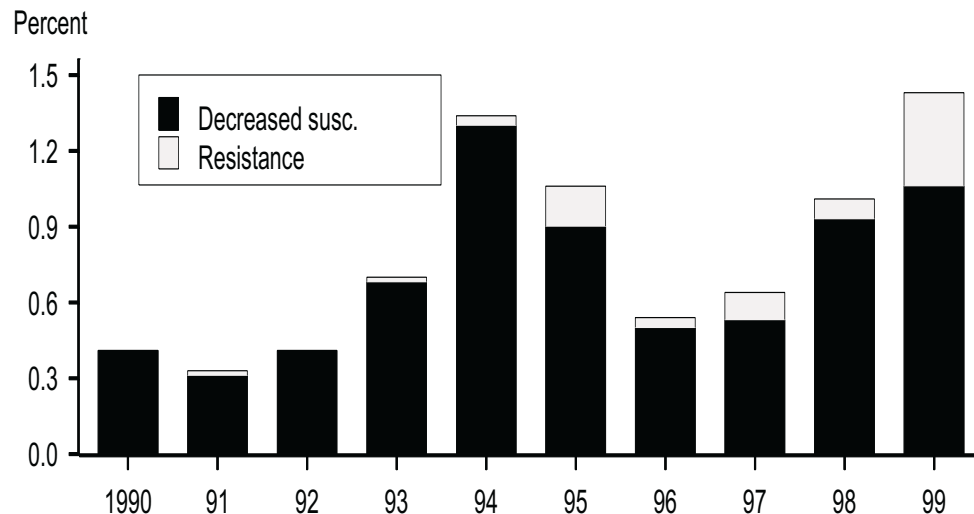


Figure 19. Gonococcal Isolate Surveillance Project (GISP) — Penicillin and tetracycline resistance among GISP isolates, 1999



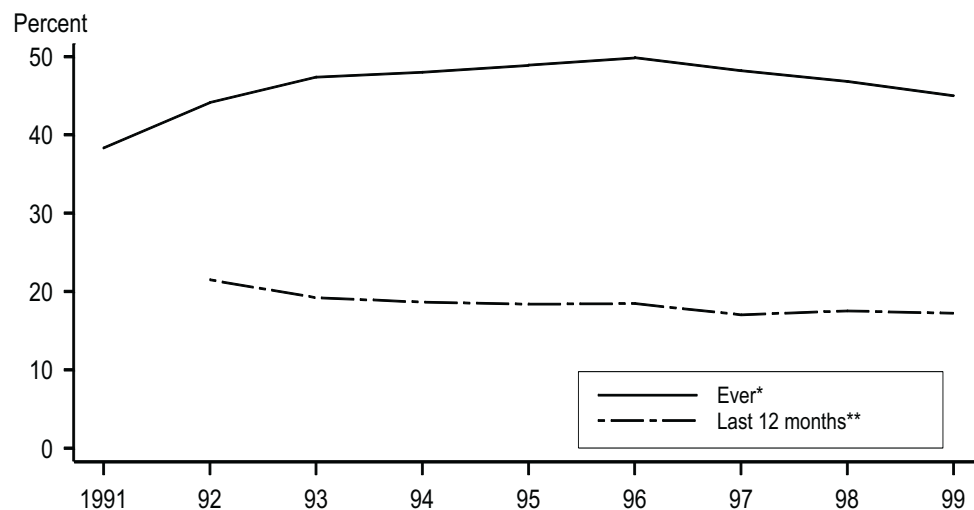
Note: PPNG=penicillinase-producing *N. gonorrhoeae*; TRNG=plasmid-mediated tetracycline resistant *N. gonorrhoeae*; PPNG-TRNG=plasmid-mediated penicillin and tetracycline resistant *N. gonorrhoeae*; PenR=chromosomally mediated penicillin resistant *N. gonorrhoeae*; TetR=chromosomally mediated tetracycline resistant *N. gonorrhoeae*; CMRNG=chromosomally mediated penicillin and tetracycline resistant *N. gonorrhoeae*.

Figure 20. Gonococcal Isolate Surveillance Project (GISP) — Percent of *Neisseria gonorrhoeae* isolates with decreased susceptibility or resistance to ciprofloxacin, 1990–1999



Note: Resistant isolates have ciprofloxacin MICs ≥ 1 $\mu\text{g/mL}$. Isolates with decreased susceptibility have ciprofloxacin MICs of 0.125 - 0.5 $\mu\text{g/mL}$. There were forty two (42) resistant isolates: one in 1991, one in 1993, two in 1994, eight in 1995, two in 1996, five in 1997, four in 1998, and nineteen in 1999. Susceptibility to ciprofloxacin was first measured in GISP in 1990.

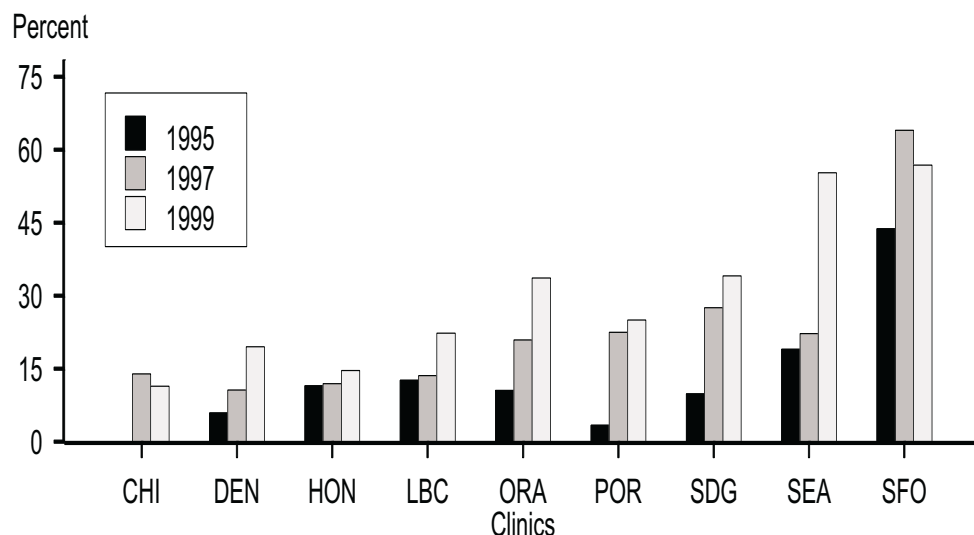
Figure 21. Gonococcal Isolate Surveillance Project (GISP) — Percent of men with gonorrhea who had a previous gonorrhea infection within the past year, 1991–1999



*Data first collected in 1991.

**Data first collected in 1992.

Figure 22. Gonococcal Isolate Surveillance Project (GISP) — Percent of *Neisseria gonorrhoeae* isolates obtained from men who have sex with men for STD clinics in nine cities, 1995, 1997 and 1999



Note: In 1999, these nine clinics reported 83.4% (511/613) of GISP gonorrhea cases in men who have sex with men. Chicago first participated in 1996. Clinics include: CHI=Chicago, IL; DEN=Denver, CO; HON=Honolulu, HI; LBC=Long Beach, CA; ORA=Orange County, CA; POR=Portland, OR; SDG=San Diego, CA; SEA=Seattle, WA; and SFO=San Francisco, CA.